IN THE CIRCUIT COURT OF THE STATE OF OREGON
FOR THE COUNTY OF MULTNOMAH

The Estate of JESSE D. WILLIAMS, Deceased, by and through MAYOLA WILLIAMS, Personal Representative,	)	
Plaintiff,	)	Volume 10-A
vs.	)	No. 9705-03957
PHILIP MORRIS INCORPORATED,	)	Morning Session
Defendant.	)	

TRANSCRIPT OF PROCEEDINGS

BE IT REMEMBERED that the above-entitled Court and cause came on regularly for hearing before the Honorable Anna J. Brown on Friday, the 5th day of March, 1999, at the Multnomah County Courthouse, Portland, Oregon.

APPEARANCES

Raymond Thomas, James Coon, William Gaylord and Charles Tauman, Attorneys at Law, Appearing on behalf of the Plaintiff;
James Dumas, Billy Randles, Walt Cofer, and Michael Harting, Attorneys at Law, Appearing on behalf of the Defendant.

KATIE BRADFORD, CSR 90-0148
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(Friday, March 5, 1999, 9:20 a.m.)

P R O C E E D I N G S

(Whereupon, the following proceedings were held in open court, out of the presence of the jury:)

THE COURT: We have all our jurors. Are we ready for them?

MR. COFER: Didn't we have one matter to take up beforehand, Your Honor?

THE COURT: Go ahead and take us back there, please.

MR. COFER: Okay. Plaintiffs filed a motion in limine to exclude any reference to the fact that Philip Morris owned products other than cigarettes. The fact, of course, is that Philip Morris companies, the holding company that owns the tobacco company, also owns Kraft, General Foods, and some other subsidiaries.

During opening statement, Mr. Thomas told the jury that we sold products other than cigarettes. During Dr. Ferone's testimony, he told the jury that one reason that he was hired was to help them diversify. I want to point out that they did, in fact, diversify.

THE COURT: Tell me exactly what you want to ask and the kind of emphasis you want to place on it.

MR. COFER: You just heard it. I am going to ask, "One of the purposes for which you were hired was to diversify, correct, Dr. Ferone; and, in fact, Philip Morris has diversified, haven't they?"

THE COURT: That's it?

MR. COFER: You heard it.

THE COURT: You can ask that. Are we otherwise ready for the jury?

MR. COFER: Do you have any questions?

MR. GAYLORD: No.

THE COURT: Is there any issue on the video?

MR. GAYLORD: There may be, and what I would propose is that sometime before Dr. Ferone leaves I would like to just make an offer of prove about what he would say about the video. And I guess what I would propose to do is play it and have him narrate it on the record outside the jury's presence.

THE COURT: If we get to a place where I can make ruling about admissibility, you can

recreate that. Is that your idea?

MR. GAYLORD: I think so. In a way, I think I can. The video has time marks on it, so if I remember to make records to those when he narrates something, then the testimony will make sense.

THE COURT: Of course, whatever you need to do for offer of proof, you'll be given a chance to do. As I am understanding, and plaintiff agrees, the defense has presented a form of order that suggests we can't do what you want to do, and you're still trying to figure out whether there is some contrary position to present.

MR. GAYLORD: I can tell you that there is an order under which this thing is in our possession, and safe to be in our possession. What I think we're still working on is a little of the chain of custody of how -- compliance with this exists.

There is an order in chancery court of Jackson County, Mississippi, governing access to and use of material determined to be privileged and/or confidential, and it specifically provides that the confidential materials can be

given to counsel engaged in litigation in similar cases.

I won't go into any more detail about it right now because I am not making a pitch for it right now.

THE COURT: Wherever your ready let me know.

Bring in the jury.

Good morning, everyone. Is Mrs. Williams here.

MR. THOMAS: I think she might have stepped to the restroom.

MR. GAYLORD: I understand that the cab bringing Mrs. Williams here was delayed. Her daughter is here.

THE COURT: I just wanted you to know you have an empty chair.

(Whereupon, the following proceedings were held in open court, the jury being present 9:25 a.m.:)

THE COURT: Good morning, jurors.

Mr. Gaylord.

MR. GAYLORD: Your witness, counsel.

THE COURT: Mr. Cofer.

WILLIAM FERONE

Was thereupon called as a witness on behalf of the Plaintiff and, having been previously duly sworn, was examined and testified as follows:

CROSS-EXAMINATION

BY MR. COFER:

Q. Good morning, Dr. Ferone.

A. Good morning.

Q. My name is Walt Cofer. I introduced myself to you yesterday. I represents Philip Morris. It's my turn to ask questions, okay?

A. Okay.

Q. On January 31st of this year, you were profiled in an article in the Washington Post; is that right?

A. That's correct.

Q. It was entitled, "Re-engineering Cigarettes," right?

A. I really don't recall that. I saw it, but I didn't read it in detail.

Q. Okay. But you did have a chance to look at the article?

A. Actually, I was sent copies, but I

distributed them, so I didn't really read it.
Q. Were you entered by the person who wrote it?
A. John Schwartz (ph).
Q. Has you talked to Mr. Schwartz before?
A. Yes.
Q. Okay. Now, I may be asking you questions about this and tell me if you disagree or are misquoted, just let me know, okay?
A. Okay.
Q. The title was, "Re-engineering the Cigarette."
"The resolution of tobacco wars," says William Ferone, "lies in making smoking safer. And the solution to that problem is already in the lab." Does that sound right?
A. Yes.
Q. Okay. Well, if you would, would you step down, please to the easel.
A. (The witness complies.)
Q. I am going to hand you a pen. If you would, please, would you write today's date and your name at the top, March 5th, 1999.
A. (The witness complies.)
Q. I want you to write this question exactly

because I am going to ask you to answer it then.
Can Philip Morris make a safe -- and underline "safe," please -- cigarette March 5th 1999, today?
Doctor, would you please answer that question. In your opinion, can Philip Morris make a safe cigarette?
A. Could you define "safe" for me?
Q. A cigarette that does not cause cancer. A cigarette that does not cause disease.
A. Okay. If we interpret "safe" to mean no statistical difference between in an epidemiological study between people who smoke and people who don't smoke, so, for example, there would be no increase costs in insurance policy or something like that, the answer is yes.
But if we mean safe in the sense of being able to absolutely guarantee no damage to a person from using the product, then the answer is no.
Q. Let me tell you how I use it for purposes of this question. I define safe as if the CEO of Philip Morris had the cigarette and stood in front of these jurors in public, could he say, "This product is safe. You can smoke it. Don't worry about cancer, don't worry about heart disease,

don't worry about emphysema. This is a safe product."

MR. GAYLORD: Objection to the form of the question. I don't think this witness has charge of what the CEO of Philip Morris is able or willing to say in public.

THE COURT: The objection is overruled. I don't think the question assumes that foundation.

Go ahead, Doctor.

BY MR. COFER:

Q. That's how I am defining "safe." Does it exist?

A. Well, first of all, the hypothetical CEO of Philip Morris saying that would be making a grave mistake, because in that statement, in my opinion is that he is implying those will cure these diseases. You can smoke this and you won't get it.

If there were other causes of those diseases, then using the cigarette would actually be a cure. I am afraid I don't -- I'm still not with you on what you mean.

Q. Let me try to do it better. I apologize if I my question is unclear.

What I meant was that, could he say, "You can smoke this cigarette and it won't cause those diseases. It's true, there are other causes of lung cancer. It's true there are other causes of heart disease. It's true there are other causes of disease, but I can tell you, members of the public, if you smoke this cigarette, this cigarette won't cause it."

That's how I am using the term "safe." Does the technology exist today?

A. Yes.

Q. Tell the jury what it is.

A. Okay. If you take a hollow cylindrical object, one of the examples I have used is a straw, and we impregnate the straw with chemicals, such that one of them delivers some of the same pharmacological responses as nicotine, let's call it one of the nicotine analogs that we developed at Philip Morris, so we put in here a nicotine analog.

Q. May I interrupt you, Doctor?

A. Sure.

Q. What nicotine analog?

A. I haven't specified which nicotine analog.

Q. Okay. That's what I'm asking. I want the actual design. Do you have a specific nicotine analog in mind?
A. I would have to go back and review the available candidates. One of the ones that we know Philip Morris has suggested, it's used in food additives, the simplest one, and it's still toxic, but in this particular application, I think it would be acceptable, is pyridine itself.
Q. Let me interrupt you there because I want to make sure I heard you correctly. You said it is still toxic, but you think it would be okay in this application. Is that what you said?
A. The one I am going to describe, yes.
Q. Pyridine is still toxic, but you think it would be okay in this application --
A. That's right.
Q. But that's the nicotine analog that your telling this jury would work, right?
A. I am not telling them it would work because I haven't done this. You're asking me to hypothesize a safe cigarette, which is what I'm doing. I don't have any test data that proves this.
Q. We'll get into that, too, but go ahead.

I apologize for the interruption.
A. Okay. So we put this material, or something better, into this device, and we also and some flavorants. Now, the key --
Q. Can I interrupt you again. What flavorants?
A. Let's just use two to, to be simple. One is not really a flavorant, it's a carrier. Let's put in some glycerine and let's put in some menthol.
Q. Any health effects with either of those?
A. There are always health effects.
Q. Okay. Go ahead.
A. So we have three chemicals only. Now what we would do, these would be sealed so that they don't have any vapor pressure before you use them. You take them out of the pack, you suck on it. There is no fire here, there's no flame; so, therefore, we're not worrying too much about products of combustion.
We would test each one of these materials separately and in combination through all kinds of tests, any kind of test we can think of, to insure that this product would provide the benefit of the pharmacological response that smokers desire

without providing any serious risk of disease.
Q. Okay. Let me stop you there, because you say you would test. To me that sounds like hypothetical. The question I am asking is whether you believe right now there is a safe cigarette as I defined it?
A. Well, what I believe is that there is technology available that can make a safe cigarette as you designed it. I am not saying right now I can recall every chemical compound that I can use in this device, but under the framework of this device, it is my opinion that done this way with proper testing that you can make a safe cigarette which is, I think the answer to your question.
Q. Anything else, is that it?
A. That's it.
Q. So it's a hollow tube like a straw.
A. Correct.
Q. And you add some nicotine analog the think may be pyridine?
A. Yes.
Q. Pyridine hasn't been tested, you don't want do commit to pyridine, right?
A. Pyridine has been tested.

Q. Is pyridine the one?
A. No.
Q. Pyridine is not the one you use?
A. I don't know if it is the one, because it hasn't been testified in all of the configurations. I haven't done the pharmacology -- it's a question of the opinion that the technology exists versus my having proven that this works.
Q. Okay. So you have an opinion that technology may exist. Here's how you describe it might work?
A. Correct.
Q. Is that right?
Now, that sounds very different than a regular cigarette; is that right?
A. Correct. This was suggested first by Scott Osborn (ph) at Philip Morris in the early 1970s.
Q. Does that have tobacco in it?
A. No.
Q. So no tobacco. It doesn't burn. Basically, you're just putting in some nicotine analog, maybe pyridine?
A. Right.

Q. Some flavorants, right?
A. Right.
Q. Glycerine and menthol?
A. Correct.
Q. Well, would it taste like a cigarette?
A. How does a cigarette taste?
Q. Well, you talked yesterday about the taste of a cigarette, about the acceptability of a cigarette, about the impact of a cigarette. You agree that in order to sell cigarettes, people have to like the taste, right?
A. Well, no, I don't think they have to like the taste. They become acclimated to the taste and pyridine is a base. It's an alkaloid. It is a base like nicotine, so it would have a similar harshness, similar bitter taste.
The glycerin is required to modify that bitter base. You can't just suck in nicotine, either, so you need to modify that to make that be the impact that you sense on the back of your throat, and you need to deliver the pharmacological response to the brain, which is the central nervous system depressant nature of the material, which pyridine would do.
Q. Now, menthol, there are cigarettes on the

market that are mentholated, right?
A. Correct.
Q. Menthol has a specific taste component; is that correct?
A. Right.
Q. Some people buy menthol cigarettes, right?
A. Right.
Q. A lot of people don't buy menthol cigarettes, right?
A. Yes.
Q. Would your hypothetically safe cigarette appeal to a non-menthol smoker?
A. I use that as an example. I could use strawberry flavor or we could use -- I could put another -- it doesn't mean anything, but I put an ethyl levulinate.
Q. Let me get you another marker.
You could add ethyl levulinate. What is that?
A. It is an ester of levulinic acid.
Q. Has that been tested for safety?
A. Yes.
Q. Is it safe?
A. Nothing is absolutely safe. It is not a

carcinogen. It is not an mutagen. It will not lead to diseases that we recognize from --
Q. What do you mean, "nothing is absolutely safe"?
A. I defined safety before. That's why I asked the question. We're exposed to carcinogens, we're exposed to mutagens from the air that we breathe, from the food that we eat. It is a question of our body's ability to detoxify those things that we're exposed to.
I am assuming -- well, I'm not assuming -- my definition of safe is that the article that we sell should not cause an increase in cancer, emphysema, asthma, heart failure, over the background due to other exposures.
As a seller of a product, I can't control the environment, I can only control my product, so if the users of my product are exposed to other causes of disease, okay, I can't control that, but I just don't want my product to add to those other causes.
Q. Okay. Just to make sure we're on the same page, it is your opinion that if Philip Morris does this, that won't cause cancer, this product won't cause cancer, right?

A. That's the hypothesis we're working under, yes.
Q. I don't want to talk about hypotheses. I want to talk about really something that I can tell my client that they can do that would satisfy Dr. Ferone, okay?
A. Okay.
Q. Can I tell -- can I take this chart and take it back to Richmond, and say, "If you do this, this satisfies Dr. Ferone. You have now manufactured the feasible design that replaces Marlboro"?
A. In discussions with your client, we could go through the chemicals you could use for this position, the chemicals that you could use for this; and, yes, you could tell them that that would satisfy Dr. Ferone.
And as I indicated a few minutes earlier, this whole logic was actually discussed as early as '72 or '73 at Philip Morris.
Q. Now, you say chemicals. What other chemicals? Let's get them on the board because I want to make sure we have what the full range of what we're talking about. What else for pyridine?
A. Well, we'd have to go back and look at

the pyridines that were studied in Dr. Seeman's work. We have to go back and look in the literature for all of those. I don't know how much toxicology has been done on this specifically. We'd have to look that up, so I can't right now as I stand here give you the list, but I could develop that list.

Q. Can you tell me, though, your professional opinion right now, pyridine would be safe?

A. I think I indicated that pyridine is toxic, but we're going to use it at a level here which is far below the threshold limiting value of any effect, other than the central -- remember, this is a drug. This product is a drug.

Q. Right.

A. Drug intrinsically are not safe. We're talking about safe in the context of not increasing the problem over some background level.

Q. You mentioned "threshold limit value." Let me make sure I understand what you're talking about, because you said a couple things.

It's true, isn't it, we're all exposed to carcinogens everyday, right?

A. That's correct.

Q. The air we breathe?
A. That's correct.
Q. The water we drink?
A. Yes.
Q. The food we eat?
A. Yes.
Q. Walking down the city street, right?
A. That's right.
Q. You did make a distinction yesterday that it is important how you're exposed, the route the administration is the term, right?
A. That's correct.
Q. Carcinogens in the stomach behave differently than carcinogens in the lungs, right?
A. Correct.
Q. We are exposed to carcinogens in the lungs every day, right?
A. Correct.
Q. Now, threshold limit value is a concept, isn't it, that basically says there is a safe level of exposure to carcinogens. And below that level, we don't expect that exposure to cause disease, right?
A. No.
Q. Explain it. I am glad I asked you

because that is what I was thinking.
A. The concept of a threshold limit value, which you will find in the National Institutes of Health and so on does not relate to any specific cause of damage. It isn't necessarily that it is safe for carcinogens or mutagens or whatever, because whatever effect the chemicals may have, including simple toxicity, so they are simply values that have been derived that says, below this level, if expose workers or expose people to it, as far as we know, we can't measure any negative effects.
Q. Okay. Isn't that the same thing in a non-scientific way -- and I apologize, I am not a scientist -- isn't that the same way as saying if you are not exposed above this amount, you're not going to get health effects from it?
A. Health effects, but you said cancer specifically.
Q. Well, cancer is a health effect, right? And there are TLDs, threshold limit values, for carcinogens, correct?
A. For things that are carcinogens, yes.
Q. And carcinogens are cancer-causing agents, right?

A. Correct.
Q. You told us yesterday about mutagens, cause the cells to change, correct?
A. Correct.
Q. Some of those mutagens can cause carcinogens, right, carcinogenic effects, right?
A. Correct.
Q. They can change a cell that cause cancer, right?
A. That's correct.
Q. So there are threshold limit value for cancer-causing agents, correct?
A. Correct.
Q. And the idea is that if you're exposed below a certain level, based on the science we know, you are not going to get cancer from that exposure, correct?
A. That's correct.
Q. Okay. That was helpful.
In your article, you were asked, "Is it possible to make a safe cigarette?" And here's the answer, and tell me whether you were misquoted. "'Forget safe,' Bill Ferone insists. 'Let's just talk about moving in that direction, by making something safer. We'll get there

incrementally by making it marginally safer.'"
Is that the quote?
A. That's correct.
Q. Is that the same thing you're telling the jury today?
A. Yes. This is the absolute end of the line. The cigarette that we're talking about in that article had tobacco in it, so in order to get from there to here, you have to pass through making it safer, reducing the amount of tobacco, and eventually getting to the point where we have a smoking device -- it is not really a smoking device -- an article that, in fact, takes the place of a conventional cigarette.
In that article, we're talking about conventional cigarette, something that you could do in the laboratory yesterday.
Q. Okay. Let me ask you this, the question is, I want to put a question mark there, too?
A. (The witness complies.)
Q. Can Philip Morris make a safe cigarette? Is that a cigarette?
A. I don't know the answer to that.
Q. It doesn't have tobacco in it?
A. If it requires tobacco in it to be a

cigarette, then obviously it is not a cigarette.
Q. Well, have you ever seen a cigarette, has anyone ever bought a cigarette that doesn't have tobacco in it?
A. No. That's because of the definition that the tobacco industry, they sell tobacco, so they have, in fact, insisted that the cigarette that they sell has tobacco in it.
Q. I see. So the reason that cigarettes have tobacco in them is because Philip Morris and other manufacturers have insisted that there be tobacco in it?
A. No. It's because if you didn't have tobacco in it, and this is asking to go to the definition of cigarettes which I am not quite sure I can do, but if it didn't have tobacco in it, then it might be ruled a drug or some other kind of article and thereby be regulated in a different manner, than if it was a cigarette. Cigarettes aren't regulated.
Q. Well, I'll tell you, I am confused about this whole drug thing, too, because tobacco naturally has nicotine in it, right?
A. Yes.
Q. You told us nicotine is a drug, correct?

A. Correct.
Q. Everyone knows that, right?
A. Everyone knows that?
Q. Well, you were taught that at Clarkson University in 1961?
A. Yes. But representatives of Philip Morris say that it isn't a drug.
Q. Well, we'll talk about that, too, but you told the jury yesterday when you were at a student and Clarkson University, you studied alkaloids, correct?
A. Correct.
Q. Nicotine is an alkaloid, right?
A. Correct.
Q. You told the jury that nicotine is a drug?
A. I consider nicotine to be a drug.
Q. You were taught that in school, right?
A. Right.
Q. So if tobacco is in cigarettes and nicotine is a drug, there is already a drug in cigarettes, right?
A. Yes.
Q. Okay. Anything else you want to add to this hypothetically safe product?

A. No.
Q. Okay. Stay right there. What's defendant's -- what is the next exhibit number? Do we know the next number? I want to mark this as an exhibit, so we'll have it and refer to it. The clerk will do that and give me a sticker. Do we have a number? 911.
I am marking this as Defendant's Exhibit 911. I'll put in the corner.
Let me ask you this question: Do you have a clue whether a single consumer in this country would by that product?
A. Clue? Yes.
Q. What is it?
A. I think if, in fact, it provided the central nervous system effect, that people would buy it. It is legally acceptable article that conferred part of the same benefits and let's remember one thing, I am not claiming to be the inventor of this concept.
This concept first came up in the context of research done at Philip Morris. Mr. Scott Osborn in a memo discussed what he called the indirect cigarette, and that's where this concept came from.

Q. Philip Morris has one. We're going to talk about it. I am going to give you a chance to show the jury and tell them how it works, so I'll admit with you -- agree with you, it first came out with Philip Morris. It's called the Accord. We'll talk about that.

So you think that it may be able to be made in such a fashion that people might buy it, right?

A. Not only that, if you tested it and you compare the biological effects, and ran through all of the animal testing and cell level testing in this product compared to cigarettes, and that was done independently by independent people, and that information was published, so that people knew that by getting their effect from this product, they would have a much lower risk from any of the diseases caused by smoking cigarettes, I think it would have a fairly good chance of becoming a popular product.

Q. What I keep hearing is if, right, if that worked, if it was tested, if the test results worked out, if you could get the flavors acceptable, if people would smoke a product that didn't have tobacco, if pyridine worked as a

substitute for nicotine, if you could get the flavors worked out, if they were below the TLVs, people might buy it?
A. Well, let's not forget that overcoming each of those ifs is simply a matter of money, time and desire, as Dr. Wakeham said to me when I joined Philip Morris.
Q. I'm glad you brought that up, because you were in change of making cigarettes for eight years at Philip Morris, correct?
A. No.
Q. Well, you were the director of applied research, right?
A. That's correct.
Q. You were hired to develop a safer cigarette, weren't you, Doctor?
A. Correct.
Q. Let's talk about that. Philip Morris recruited you. You didn't seek them, they recruited you right?
A. That's correct.
Q. They made four representations to you, didn't they? They told you they wanted you to work on a safer product?
A. That's correct.

Q. They told you that they wanted stood diversify?
A. That's correct.
Q. They told you they would give you a year or so to learn the business, right?
A. That's correct.
Q. And they told you that if that worked out you would become a director, right?
A. That's correct.
Q. Now, you spent 80 percent of your time at Philip Morris working on studying safer cigarettes, didn't you?
A. That is correct.
Q. Philip Morris did, in fact, diversify, didn't it?
A. It did.
Q. They gave you a year with essentially unfettered access -- you talked about the secret labs, we'll go to that in a minute -- essentially unfettered access to scientists, to departments, to people you needed to talk with to learn about cigarettes, didn't they?
A. Except for the testing parts which is critical.
Q. We'll talk about that, too, but they gave

you wide access to the resources, to the people, correct?
A. Yes.
Q. And in a year, they made you a director?
A. They did.
Q. I should have had you write it down. Let's see if we remember: Money, desire, and what was the third? Resources?
A. That's good.
Q. Did you have a desire to make a safe cigarette?
A. I did.
Q. Put a yes by that.
A. But this was corporate, not mine.
Q. Did you have a desire to make a safe cigarette?
A. I did.
Q. You were director of applied research, correct, sir?
A. Yes.
Q. You spent 80 percent of your time studying how to make a safe cigarette, right?
A. That's correct.
Q. You had a staff of people working for you, didn't you?

A. I did.
Q. Ranging from 40 people to 200 people, correct?
A. Correct.
Q. On average, you had 150?
A. Correct.
Q. How many of those people were scientists?
A. I think about a third.
Q. How many of those people had advanced degrees?
A. 80 percent, maybe more.
Q. Some had Ph.Ds?
A. Correct.
Q. Some had master's?
A. Correct.
Q. Many of those people worked 100 percent of their time working on making a safer cigarette, correct, Doctor?
A. That is correct.
Q. Did Philip Morris ever deny you money to do research?
A. Well, yes.
Q. Tell the jury what project you weren't able to do because Philip Morris said, "We don't have the cash and we're not going to spend it."

A. Implementation of naturally occurring denitrification project.
Q. Let's start list two. I'm getting out of order, but we'll come back to it. Write, "Money," and just so it's clear write, "Projects killed."
I want you to tell the jury every project that Philip Morris killed that you wanted to work on to make a safer product.
A. Okay. Let's start with denitrification.
Q. And so we're on the same page while you're writing that, is that the naturally occurring denitrification project that Dr. Uydess told us about?
A. Any one of three different projects.
Q. Let's list them. I want to get them all out.
A. Naturally occurring denitrification project.
Q. Is it NOD or NOD, because we debated about that. What did you guys call it?
A. Both.
Q. Okay. So NOD.
A. Then there was one called NINO.
Q. What's that?
A. This is an anaerobic process, and this is

an aerobic process. They're both microbial processes. We were involved in all of them, but this is the one that was developed in Switzerland.
Q. Let me stop you to make sure we're on the same page, because this for me is pretty scientific. Basically, I think the way this was described, this was the bacteria that ate the nitrates, right?
A. Yes.
Q. Kind of like the Pacman analogy someone made, the old video game. And the thinking was you could take naturally occurring microorganisms and you could work them with the tobacco, and they could eat the nitrates, and you would end up with nitrosamines was the bottom line, right?
A. You end up with no nitrates, so when you burned that material you would reduce the cause of the nitrosamines, or one of the main causes was the nitrate.
Q. Right.
A. You also reduce oxides of nitrogen in the smoke which in and of themselves is not good.
Q. So both of those had that basic thesis, right?
A. That's correct.

Q. One occurred in Richmond?
A. That's right.
Q. And other occurred in Switzerland?
A. Correct.
Q. Okay. You were familiar with the process in Switzerland?
A. We were involved in both.
Q. And essentially, Philip Morris was looking at two different ways to accomplish the same thing, right?
A. Right.
Q. Almost professional competition, had Switzerland working on one approach and you guys working on another?
A. Well, it was a joint effort. I wouldn't call it professional competition.
Q. Okay. All right. This denitrification, was this for the RL blend?
A. Well, it was -- the part that we talked about was only for RL, but it was actually used on both tobacco, especially this process. Switzerland actually added the microbes to bulk tobacco.
Q. What kind of tobacco?
A. Bulk, b-u-l-k.

Q. Just while we're there, the NOD project, at least the way I understood the way Dr. Uydess testified -- is it Uydess or Uydess?
A. I think it's like Ferone and Ferone. You can do it either way.
Q. All right. I think what he testified about was you had this RL, reconstituted leaf, that you told the jury about yesterday, right?
A. Right.
Q. That is where they take -- it's a paper-making process?
A. Correct.
Q. And what they did is they already used a process to reduce nitrates in that process, right?
A. Correct.
Q. Called crystallization; is that right?
A. Correct.
Q. And crystallization is effective in reducing or removing 90 percent of the nitrates, correct?
A. That is correct.
Q. And that's used. That's where they distill it and it falls out?
A. Cool it and it falls out.
Q. Cool it and then it falls out.

And so this process, this process was directed at trying to go after the other 10 percent, correct?
A. Initially after the other 10 percent in the RL process, and then eventually going after the tobacco in storage.
Q. Right.
A. Because we store it for different times, to reduce particularly in Burley tobacco the nitrates in Burley tobacco.
Q. And that's the way science and innovation works, you start with a hypothesis, and then you start testing it in a lab, and in this instance, you built a pilot plant, right?
A. Correct.
Q. And then you start trying to do it on a bigger basis to see if it works, right?
A. Correct.
Q. And if it does work, you say, "Let's implement it more broadly, right?
A. Correct.
Q. Okay. But as far as this thing went, you were working on RL, and the idea was to get the 10 percent of nitrates that crystallization didn't get, correct?

A. That's correct.
Q. What's the third method?
A. Electrodialysis.
Q. Now, what's that?
A. If you have a membrane in this liquid that contains the nitrates, and you pass an electric current from one side to the other, it can cause the charged ions -- in this case, the nitrate -- to move through the membrane, so then all of the material on the side where it moved away from it is free of nitrate.
You can go ahead and use that. So they put the solubles or they extracted liquor on one side of the membrane, and put water on the other side of the membrane and drive the nitrates across the membrane into the water stream.
Q. Okay. So as I understand it, Philip Morris killed the nitrification. There were three different approaches that were being used and they stopped it, right?
A. Correct.
Q. Okay. Let's go to the next type of project they killed.
A. Notification of tobacco curing. That's the idea of using the air cure Bright to -- draw a

line here -- to replace Burley.
Q. And let me stop you there and see if we're on the same page, and then we can go on.
Basically, you talked about three different types of natural tobacco leaf that went into a cigarette, right?
A. Basically.
Q. You got your Bright, correct?
A. Correct.
Q. You have your Burley?
A. Right.
Q. You have your Turkish or Oriental?
A. Correct.
Q. Each of those leaves have different characteristics, don't they?
A. Yes.
Q. Different flavor attributes?
A. Yes.
Q. Different nicotine levels?
A. Yes.
Q. Different other aspects. It is a natural product peculiar to each type of tobacco, right?
A. That's right.
Q. Was it Burley that has more nitrates in it?

A. That's correct.
Q. So the thinking was, if you could somehow get rid of the Burley and use Bright, you start with a product with less nitrates, correct?
A. That's part of it, yes.
Q. And the idea that would be important because if you had less nitrates you get less nitrosamines?
A. Correct.
Q. And nitrosamines, you believe and the public health community believes, and the science believes, may be one of the classes and compounds that causes disease in cigarettes, correct?
A. Maybe one of the classes of compounds that leads to the specific types of carcinomas that are associates with smoking.
Q. Okay. Let's just cut through it. Nitrosamines cause lung cancer in humans. That's what we're talking about.
A. Exactly.
Q. So what you wanted to do was find a way to replace Burley with Bright, correct?
A. Correct.
Q. And one way to do that was to cure it differently?

A. Yes.
Q. Would Burley have tasted like Bright, then?
A. No, Bright would taste like Burley.
Q. Bright tastes like Burley then?
A. Yes.
Q. Burley does have a specific flavor characteristic?
A. That's correct.
Q. Your view, though, is you can do this and just make it no Burley, just replace it with Bright?
A. Actually, that was tested. I think some three million dollars were spent buying tobacco where the Bright had been air cured to make it like Burley, and it was tested in a wide variety of cigarettes.
Q. Thanks for that. Let's do put money back here, put money at the top there. That reminded me of something.
You say Philip Morris spent three million bucks on this?
A. Yes.
Q. And then just didn't implement it?
A. Correct.

Q. How much did Philip Morris spend on these various denitrification projects?
A. Would you like me to estimate that, since I don't know exactly.
Q. Give me your best ball park. I won't hold you to the specifics.
A. Probably about two million.
Q. 200?
A. Two million.
Q. Two million. Okay.
A. This is based on the R&D budget being about 50 million.
Q. I will get the figures. I understand no intent to mislead. That's just your best ball park right now, two million, three million, five million bucks, right? Has any other company used in denitrification process, any of Philip Morris' competitors?
A. Not that I am aware of.
Q. So to your knowledge Reynolds hasn't?
A. Well, Reynolds has an extraction process, or had an extraction process. And I'm trying to remember and I can't as I stand here whether or not it happens to remove nitrates. Certainly, they don't have a biochemical process that I'm

aware of.
Q. Brown & Williamson?
A. Yes.
Q. Lorillard?
A. Yes.
Q. Liggett?
A. As far as I know.
Q. Japan Tobacco?
A. It may.
Q. Japan Tobacco may?
A. I'd have to go back and look. I don't know exactly what they're doing. I can only tell by looking at their patents and their published papers and technology.
Q. We'll come back to it, but patents don't tell you what someone is doing, right?
A. That's true.
Q. They tell you the technology of the patent, correct? In fact, lots of things are patented never make it to the real world, correct?
A. Correct, but what they do they tell you is what people believe.
Q. Tell you what people are thinking?
A. No. Tell you what they believe, because in order to get a patent, you have to sign an

affidavit that says, "To the best of my knowledge and ability, this is true," so what is in a patent at least at the time it was filed is true. It may not be what they're using, but at least it's true.
Q. What it tells you is there is scientific data and scientific reasoning to believe it could work, right?
A. Correct.
Q. Or at least the idea is a good one, correct?
A. Yeah. And we believe it is correct, yes.
Q. But you would agree that many, many, many patents inside the tobacco industry, outside the tobacco industry, never come into fruition, correct?
A. The technology is never used, correct.
Q. Or the technology isn't developed?
A. Right.
Q. You are really patenting ideas and processes, correct?
A. Well, you can patent an idea. That's called a prophetic patent, but most of the time, at least at Philip Morris, the things that were patented actually had some physical proof of concept where it was actually done in the

laboratory.
Q. Okay. So to your knowledge, do you know other companies using any of these microbial nitrification processes; is that right?
A. That's correct.
Q. Or electrodialysis?
A. I don't know.
Q. How about modification tobacco curing, does any company do that?
A. They may.
Q. Do you know whether they do?
A. I don't know for sure.
Q. Okay. It seems to me to be a pretty simple things to do, right?
A. Yes. I think it may be being done in South America.
Q. Okay. You think it may, you don't know?
A. I have some information from talking to people, but, obviously, I don't have the records of tobacco companies in South America.
Q. Tell us what you know. I don't want to keep anything back. You say you have some information, what do you have?
A. My understanding is that some of the tobacco being grown in Brazil, for example, is

Bright cultivar or seed that was originally derived from Bright, and it is being air cured, so that would be an implementation, but I don't know who's buying the tobacco and I don't know who is using it.
Q. We're going to get do that, but just to kind of force it out as Mr. Gaylord did yesterday, Philip Morris doesn't grow tobacco, does it?
A. I think they do, yes.
Q. Well, they don't grow the tobacco they put in their cigarettes, correct?
A. I am not even sure of that.
Q. Doesn't Philip Morris buy its tobacco on the open market?
A. I believe Philip Morris owns a tobacco concern in Costa Rica.
Q. So you say that Philip Morris does grow some of its own tobacco?
A. I think they do, Costa Rica.
Q. I don't know whether that's true or not. We'll find that out.
A. Okay.
Q. You agree that Philip Morris buys a lot of its tobacco on the open market?
A. Oh, yes.

Q. That tobacco is regulated by the Department of Agriculture?
A. Well.
Q. They set price supports depending on the quality and type and all that?
A. That's a program that the U.S. Department of Agriculture has in concert with the tobacco farmers.
Q. All right.
A. But it's not a regulation from the sense that they dictate what has to be grown.
Q. They dictate in a sense that the price supports depend on them complying, right?
A. Yes. But, for example, if you wanted to change the kind of tobacco that is grown, anyone can go into a program and help convince the farmers and U.S. Department of Agriculture that we could should change -- we're going to come to that next -- that we should change the kind of tobacco that's grown to make is less hazardous.
Q. Let me make sure I understand how this works. The Department of Agriculture has requirements in grading and price supports for different types of tobacco, right?
A. Correct.

Q. How much money the tobacco farmer gets depends in part on how they comply with those grades, right?
A. Correct.
Q. So tobacco farmer could go out and pioneer new types of leaf, I guess, right?
A. Well, that wouldn't be the way it works. There is a cultivar selection program. In other words, the first thing that happens, the United States Department of Agriculture usually in concert with the agricultural extension colleges and universities tries new types of tobacco.
Q. Okay. Who does that now, the Department of Agriculture with colleges and universities?
A. Yeah, like North Carolina State. There is land grant colleges in each state that have agriculture departments, and those agriculture departments, the ones I think in the tobacco growing states, they try and test new varieties of tobacco and new cultivars.
Q. That's the Government and these universities, right?
A. Yes.
Q. Go ahead.
A. And on the basis of that, the tobacco

varieties that are going to be grown in the future are selected, and then the seeds are developed. Most of the farmers actually buy little tiny tobacco plants rather than plant seeds, and so that dictates -- not dictates, but that -- these of the kind we're going to grow.

On the basis of what they decide they're going to grow, then they implement a grading program.

Q. Okay.

A. Because there is a different quality of leaf from the bottom of the stock, middle of the stock, top of the stock, so there are grades depending on the stock position.

Q. Right.

A. And that then fixes the prices.

Q. Now, who does the grading?

A. Well, anyone can.

Q. Who sets the grades, though?

A. ISDA sets the guidelines.

Q. Well, enough on that for the moment.

What is the next project Philip Morris killed that was directed towards developing a safer cigarette.

A. Genetic modification of tobacco.

Q. Tell the jury about that.
A. Well, that's come up several times in the history of Philip Morris. The time that I was involved with it, the idea was to take tobacco, tobacco is a very easy material to grow in a test tube, culture, and to create genetic modifications in cell level work, and to grow those back.
It is like a cloning process. We can plant them in the field. And the idea was to create in one shot 10,000 or 20,000 different kinds of tobacco. The idea would be to create kinds of tobacco that, for example, would not have tobacco specific nitrosamines in it, tobacco that would not take up nitrate, tobacco that would not pick up on the surface of the leaf polonium 210, which is was a isotope of polonium that was implicated and caught in the lung and potentially cause a problem.
Q. Is that heavy metal?
A. It's a radioactive heavy metal.
Q. Radioactive heavy metal?
A. Right. And the research was done that established, for example, in the polonium 210, that about half of what's in tobacco is on the leaf surface. You can actually wash it off, but

that's very difficult, so the best thing to do would be to make tobacco which didn't have it to start off with.

And the theory there is on the surface of the leaves there is a tricombs. It's the opening to the tobacco which surrounds the stemmata where the air goes in and out of the tobacco and respiration, and the idea was those are sticky and it's wax, and so this material sticks on the surface, so we would make a non-sticky tobacco surface.

So the other thing we were looking for, when you burn it, there might be useful modification due to the structure of the cellulose. It was known at the time, for example --

Q. Let me stop you there. Write the time frame down.

A. This was 1983-'84.

Q. Okay.

A. It was known at the time that cellulose, that part of all plant material, if you burn that, that alone, the biological result from those tests look much more favorable. This goes back to the testing --

Q. Let me stop you there. Biological results, what do you mean by that, biological activity?
A. Well, there was also animal testing done in this particular case.
Q. Who did animal testing?
A. I don't know exactly who did it. The results that I've seen were -- this was cytrel that was used.
Q. Did Philip Morris do it?
A. I don't remember. On the pure cellulose material?
Q. Did Philip Morris do animal testing?
A. Yes. Philip Morris did animal testing.
Q. Where did they do it?
A. INBIFO.
Q. You knew about that?
A. No, I've seen it since.
Q. You didn't know about it at the time?
A. At the time, I knew the results were being submitted to the U.K., the Hunter Commission, with regard to cytrel. I didn't know where the tests came from.
Q. Let's just back up. So Philip Morris was doing some testing in '83-'84 on genetic

modification on tobacco, right?
A. Yes.
Q. They were doing animal testing in INBIFO, correct?
A. Correct.
Q. That's the lab they own in Germany?
A. Correct.
Q. Keep going.
A. Anyway, so there are all of these reasons to create genetically-modified tobacco. One other reason was looking for tobacco, for example, test tube from time to time, get some that doesn't make any nicotine or any alkaloids. That tobacco would not make any tobacco-specific nitrosamines.
Q. Let me stop you right there. If the tobacco had no nicotine, you would get no tobacco-specific nitrosamines, right?
A. Yes.
Q. You told the jury yesterday that no one would smoke a cigarette without nicotine, right?
A. Yes.
Q. Right?
A. Absolutely.
Q. Go ahead.
A. So if you use that in the product, what

you would have to do is extract nicotine from other tobacco and add only the nicotine, no nitrates, only the nicotine, so the product would be a tobacco base that you grew that had no nicotine in it, no nornicotine, no nitro nornicotine, no NNK, so we got rid of all of that stuff.
Q. Okay.
A. And now we add back in only the nicotine.
Q. Let's just talk about that because I want to talk just kind of general concepts. It's true, isn't it, that really the kind of general assumption that people who have looked and this issue have had is it's the tar in tobacco that causes health problems, right?
A. Correct.
Q. Nicotine is the reason people smoke, and we'll talk about cardiovascular issues, but with respect to maybe some issues with the heart, nicotine doesn't cause the health problems, rights?
A. That's correct.
Q. So the thinking was, and this started way back, that if you could bring the tar levels down, you were making great progress towards eliminating

a lot of the risk of smoking, right?
A. That is correct.
Q. In fact, Ernst Wynder, that's Wynder-Graham, the guy that did the mouse skin painting. He was a proponent of that, right?
A. The main proponent.
Q. One of his colleagues, Dietrich Hoffman, was a proponent of that, correct?
A. Yes.
Q. Didn't Ernst Wynder publish in 1957, that if you reduced tar and nicotine levels by 50 percent, you were making substantial progress in eliminating or reducing the risk of smoking, correct?
A. He published that, yes.
Q. He believed it?
A. At the time he published it, he believed it.
Q. In fact, the Surgeon Generals believed that over the years?
A. Yes.
Q. The National Cancer Institutes believed that over the years?
A. That's correct.
Q. Tobacco Working Group has believed it

over the years?
A. Correct.
Q. American Cancer Society has believed it over the years. And that's been the operating assumption, bring the tar and nicotine levels down and you're doing a good thing, right?
A. Right.
Q. Now, the problem, from your perspective as I understand it is when you bring the tar down, nicotine follows, right?
A. Correct.
Q. So what happens is you get the tar and nicotine levels down too low, people start adjusting the way they smoke to get the nicotine, right?
A. Correct.
Q. When they adjust the way they smoke, they take in more tar, right?
A. Right.
Q. So they get too much of the bad stuff?
A. Correct.
Q. And in fact, your view would be -- correct me if I'm wrong, I don't want to put words in your mouth, what we ought to do is take the tar down and then boost the nicotine level, so people

would get the nicotine they want without getting the tar, right?
A. It wasn't just my view. That was a popularly held opinion at the time, even before I arrived at Philip Morris.
Q. Well, that's your view right now, isn't it?
A. No. Well, my view is that in terms of a step along the way, that that's the right thing to do, so I am not denying that it is the right thing to do. The problem with it is, what you're talking about, 1959, we're talking about 1970, 1982-'83, 15 years have gone by.
There are no reductions. There are no significant reductions in smoking-related disease, so we know that the level of carcinogenicity, what we underestimated was -- this is what I brought up yesterday -- we had 100,000 bullets that we're shooting, we took out 90,000 of them, 10,000 is still enough to get you, so we have to take out more.
Q. I think you said something, and I want to check and make sure everyone agrees on this. You are saying that the epidemiology coming in doesn't show any benefit from the reduction of tar and

nicotine?
A. Amongst smokers.
Q. Amongst smokers?
A. We're not talking about more people quitting or leaving. My testimony is, as far as I understand it, the incidents of the type of lung cancer associated with things like the tobacco-specific nitrosamines and things of that type, has not decreased. It has increased, according to Hoffman's 1995 and '96 papers.
Q. Okay. There are two concepts here, so let's make sure we're on the same page. What I think you are telling me is that the epidemiology is coming in, the people who smoke low tar and nicotine cigarettes really didn't get a health benefit, right? Is that what you're saying?
A. I am saying that the health benefit was unnoticeable. I am not sure they didn't get one, but you can't prove that they did.
Q. You can't prove that they did.
All right. But the thing, though, is everybody thought that was the thing to do?
A. Including myself.
Q. So what you're saying is now that the evidence is in, it looks like everybody was wrong?

A. Well, no. I said yesterday that if we had done biological testing, animal testing on finished products that I could see, Marlboro versus Merits versus Merit Ultra Lights, we may have been able to conclude that without waiting 15 to 20 years for the epidemiology to tell us that.
Q. Okay. I want to talk -- you talked about this. I'm going to take that on and talk about it in two different ways.
First, let's talk about what Philip Morris did. There is a reference cigarette. There is a Kentucky reference cigarette; there are other reference cigarettes, correct?
A. Correct.
Q. Those are designed to specific specifications, right, they're publicly known?
A. Yes.
Q. And the idea is that you could test them from lab to lab?
A. Yes, because they change; but, yes, you can.
Q. But when they change everybody knows what they are, right? I mean, Philip Morris didn't test one and then National Cancer Institute tests one and test different things?

A. No. But when you're making a batch of cigarettes, however, you have to use the tobacco that is available to you at the time. This was a cause of great concern and debate.
If I take those cigarettes and make another reference cigarette three months from now, I don't have the same tobacco.
Q. Right.
A. And if I could keep the cigarette, the moisture goes out and it may not be the same.
Q. It changes over time, just the natural degradation of the product, right?
A. Yes.
Q. But anyhow, back on this whole reference thing, so you made a reference cigarette. Everybody knows how much Bright, how much Burley, how long they are, the diameter. There is no additives it, no secret ingredients in them, everybody tests the same thing, right?
A. That's the control in the test.
Q. So Philip Morris tests it, and says, "I got result A," and private independent lab over here can test it and say, "I got A or didn't get A," right, because you're testing the same thing?
A. Yes.

Q. Stay with me on this. And you can do additive testing separately. Now, your complaint as I understand it is, you shouldn't have done the additive testing separately, test the tobacco and then the additives, you should put it all together, because that is what the smoker smokes?
A. No, that is not my complaint.
Q. What was your complaint?
A. My complaint is that the reference cigarette isn't a Marlboro, the reference cigarette isn't a Merit.
Q. Okay.
A. The changes that we were making, for example, in going from Marlboro to Merit, were intended to make a safer cigarette.
Q. Okay.
A. Okay. Those are the two products that need to be tested directly, Marlboro versus Merit, in animal testing and cell-level testing and they need to be representative of what is being sold on the market.
Q. Okay.
A. And they need to be representative of what you sell on the market every three months periodically.

Q. Okay.
A. Because that's the only way you know whether the change you have made are actually getting to the smokers. Smokers don't smoke reference cigarettes.
Q. Okay. A couple things on that. Well, did the Surgeon General or the National Cancer Institute or Ernst Wynder at the American Health Foundation, they were able to test Marlboro and Merits, whole product testing?
A. I think the agreement with the National Cancer Institute was they wouldn't do that.
Q. Well, a private researchers out, you just have to go to the store, buy them off the shelf and take them in and do full product testing all day, right? That testing can be done?
A. That testing can be done, that's true.
Q. Okay. Well, has that testing been done and shown big differences?
A. I don't know if anybody has had the resources, other than the tobacco company whose products they are, to do that type of testing. You have to have animal laboratories, you have to have cell testing laboratory to do that.
Q. You can contract that stuff out, can't

you?
A. Who is going to contract it out?
Q. How about the Federal Government? How about the National Cancer Society?
A. I am losing you here.
Q. My point is, as I understand where your complaint is, is Philip Morris didn't test a Marlboro as a Marlboro, right?
A. And the suggestion -- what you're saying is that we can use taxpayer money to test the products at Philip Morris, they don't need to do that?
Q. You don't want to get into taxes, do you? You don't want to go there, do you?
A. You can.
Q. Here's what I'm saying. Philip Morris tested reference cigarettes, correct?
A. Correct.
Q. Philip Morris tested additives, right?
A. Philip Morris tested additives?
Q. Additives to tobacco.
A. They tested them separately from the reference cigarette?
Q. So Philip Morris tested, for example, when you burn it, it becomes carcinogenic. I

don't want to spend a bunch of time on this, but we can, as I understand the debate, where it is sufficient to test the reference cigarette and the stuff you put in it separately, or whether you need to test the stuff altogether. Is that what we're talking about?
A. No, no.
Q. Okay. Let me ask you this, you would agree, whether Philip Morris did it, other people could have done it if they wanted to?
A. I agree that other people could have done it if they wanted to.
Q. Can you cite a study where they said the Marlboro testing is different or worse? The whole product testing made a difference?
A. Yes.
Q. Tell me the study, write that down.
A. It is in the Japan Tobacco and Salt Monopoly, the Japanese patents. They don't list what they are.
Q. Let's write that down. Let's flip a page. Whole product testing that was done on Marlboro that shows something different.
A. Okay. The problem is I don't know which in that study is which brand.

Q. If you don't know which was which brand, how can you tell the jury what it meant?
A. No. The question was whether or not it was done. I am just telling you I know where such research was done. It was done under codes. You would have to ask the Japan Tobacco and Salt Monopoly, what it is called now, which one was which, but they did that for some of their patent work to show that the -- their patented products were safer, were safer than Marlboro, but I don't know which was which.
Q. Was that published in the scientific literature?
A. I believe -- certainly, it is in the patent literature, but, yes, there are scientific literature.
Q. Write down then Japan Tobacco, patents, scientific literature.
A. (The witness complies.)
Q. Would you write testing up there, it's whole product testing.
A. (The witness complies.)
Q. Okay. Let's go back to projects Philip Morris killed. Do you know how much money was spent on genetic modification of tobacco?

A. Well, the problem with this is there are two projects. There is one while I was there, and there was one after I was there, the Calgene project, C-a-l-g-e-n-e, and I don't know that one. The incident here was to -- I believe the contract if I recall correctly was $300,000. It's with a company called Crop Genetics International, and we probably spent another half a million dollars internally.
Q. So Philip Morris contracted with an outside company to do some of this?
A. Yes.
Q. And did some in-house?
A. Yes.
Q. What's the next project Philip Morris killed?
A. Measurement of radioactive compounds going into cigarettes.
Q. Tell the jury about that.
A. I mentioned earlier that I think it was 1979 and 1980, Dr. Robert W. Jenkins and Dr. Mary Ellen Counts (ph), found that polonium 210 was picked up on the surface of tobacco leaves and about 50 percent of it went in the tobacco, and 50 percent upon the leaf.

Q. Could I stop you for a second. Where did it come from?
A. It comes from the fertilizers that are applied to tobaccos. The small amounts of uranium series degradation products in fertilizers, so that when you put it on the field and the wind blows, it gets on top and goes in. It also occurs in certain soils, you can have the problem.
Q. Who applies the fertilizers?
A. The farmers apply it.
But the idea here was, "Okay. We can't control the fertilizer and what the farmers apply, but what we can do is measure the product that we're using to make sure that the radioactivity is very low, beyond some low level.
So at the end of 1981, around '81, we set up -- Dr. Rosene's group actually did, a low level laboratory to measure whether or not some of the materials used in tobacco products were radioactive, and started making some measurements, and according to information I received from Dr. Rosene, he removed from the production stream certain materials that he felt were too radioactive to be use in making cigarettes.
Q. Okay.

A. And this is no longer being done, I understand, so some time between the time I left in 1984 and 1994, this was stopped.
Q. Okay. You know, and I haven't been very good about -- in terms of how I asked the questions, so let me see if I can pick this up. What I am really interested in at this point is projects while you were there that you had first-hand knowledge about, okay, and which ones are those?
A. I had first-hand knowledge of this.
Q. This occurred while you were there?
A. This was going on while I was there, but stopped.
Q. Okay. But you learned that it has been stopped since then, right?
A. Yes.
Q. All right. But all of these were going on while you were there.
A. There are two of these. There is the modification one that I was directly involved with, and the Calgene one occurred after I was there.
Q. Okay. And modification of tobacco curing, is that while you were there?

A. That is while I was there.
Q. Now, did you think at the time, Dr. Ferone, that these projects that were going on and killed while you were there, that they were going to allow you to make a safer product, had you been able to follow them?
A. May I make a slight modification?
Q. Sure.
A. I think this was actually going on when I left. I only know that it was totally killed subsequent.
Q. Okay. Do you want me to repeat the question?
A. Yes.
Q. Have these things gone on, been allowed to have gone on, would they have made a difference?
A. Yes.
Q. When they were stopped, what did you do about it?
A. Well, as I said, this wasn't stopped while I was there. When I left, I was under the impression that this was going to be used, okay, even though it was stopped temporarily. The genetic modification was ongoing when I left.

Q. Okay.
A. And this was ongoing when I left.
Q. Okay. So those were all stopped after you were gone, right?
A. They were ongoing while I was there and they were -- well, this was actually stopped in the sense that the tobacco that we purchased, the three million dollars worth, was used up, but no one said, "We're not going to use this."
Q. Was there any project that was being worked on to make a safer product stopped while you were there?
A. There is many more than this list.
Q. Give me your best one, the one that was the biggest problem while you were there.
Nicotine analogs?
A. Right.
Q. We're going to come back to that. That was not one you supervised. You are talking about Vic DeNoble and others?
A. I supervised some of the people that made the analogs.
Q. Give me another one that was in your department, and we'll come back and spend a lot of time on nicotine analogs.

A. (The witness complies.)
Q. Tell the jury what that is.
A. When I arrived at Philip Morris in 1976, Philip Morris had applied for and received a patent in 1974, for producing a filter material or a catalyst, if you will, that would, in fact, remove carbon monoxide from smoke.

The unfortunate part of this material, it's a cobalt catalyst, the unfortunate thing was that when it was wet, it wouldn't work very well. When you smoke a cigarette, of course, the smoke coming through is wet, so it would deactivate the catalyst.

The group working for me decided that they would re-look at that; and, in fact, produced a catalyst material through which you could smoke 20 cigarettes without it becoming deactivated. And this was actually demonstrated, smoke a pack of cigarettes through it, and I think it is about 1981-'82, something in that time frame.

Mr. Wally McDowell presented that idea to the Board of Directors and said, "Well, we could sell this product on the market." It was presented as being one of our major accomplishments for the year, of having taken this

technology which previously was thought not to work and put into a product.
Now, one of the things about the product that we tested, it wasn't inside the cigarette filter, so this would have been an article that you put cigarettes in, like an external filter, and smoke the cigarettes through that.
The concept at the time was that you would sell one of these with a pack of cigarettes and you would smoke the pack of cigarettes through the filter.
Q. And let me make sure I understand. You thought that would reduce carbon monoxide, right?
A. The evidence showed that it would remove more than 99 percent of the carbon monoxide.
Q. You thought that would provide a health benefit to the smoker?
A. Right.
Q. And you thought it was ready to roll, correct?
A. Right.
Q. And Philip Morris killed it, right?
A. Right.
Q. What did you do about?
A. Complain.

Q. Did you write memos?
A. No.
Q. You didn't write any memos?
A. Well, the methodology for doing that is to discuss that in terms of the plans and concepts for future ongoing work. I have used the work, "paralysis by analysis."
Q. Right.
A. The reason why you don't complain is because in that particular case, let's take that as a good example, somebody says, I would like to have it inside the back end of the cigarette," so it is another hurdle that is thrown out. So our job, as scientists, was to try and overcome every hurdle that is placed in the way of implementing these technologies.
So we tried subsequently, and that work was still ongoing, to make that filter so that you could leave it in, it would be in the pack -- in the back end of the cigarette without anybody knowing it's there.
Q. See, I thought you told me yesterday that your job was to make a safer cigarette.
A. That's correct.
Q. You devoted 80 percent of your time to

that?
A. Right.
Q. You told us you had a desire to do it, right?
A. Correct.
Q. You had a product that took out 99 percent of the carbon monoxide, correct?
A. Correct.
Q. Confers a health benefit on smokers, right?
A. Reduce the risk from carbon monoxide.
Q. That confers a health benefit, doesn't it?
A. Correct.
Q. You thought it was ready to roll?
A. Yes.
Q. Philip Morris wouldn't implement it, would they?
A. No.
Q. You didn't write a memo?
A. No. We talked those things over. We had meetings. "We'll consider it as part of future programs if you can get it inside the filter." So why would you write a memo?
Q. Well, didn't you believe in the product?

A. Sure.
Q. Didn't you think that you were accomplishing your job?
A. Yes.
Q. Didn't you want it implemented?
A. Yes.
Q. Didn't you want to get someone's attention and say, "Put this thing in a pack."
A. We wrote memos about it. We presented it at Richmond meetings. We had meetings where senior management came in, the president, the chairman of the board.
Q. But I couldn't go to the Philip Morris file and find no memo where you said, "This is wrong. This is a bad decision. Put this in the product. Put it in the pack and sell it to consumers?
A. I don't think you'll find that.
MR. COFER: This would be a good time.
THE COURT: Jurors, 15 minutes, please.
(Whereupon, the following proceedings were held in open court, out of the presence of the jury:)
THE COURT: Anything for the record?

MR. GAYLORD: No, Your Honor.
MR. COFER: I'll trying to talk more slowly.
THE COURT: I think you did better after the last piece. We're off the record.
(Recess taken, 10:40 a.m. to 11:00 a.m.)
THE COURT: Mr. Tauman?
MR. TAUMAN: Thank you, Your Honor. I already served, and I'm going to hand to you a motion to compel production that I am not anticipating, although I am ready to argue it now, but it is rather simple and focused, and I thought maybe at the noon hour or in the afternoon break, the parties may be -- this has been under discussion for at the least a few days here.
THE COURT: All right. I see what the issue is and just need your guidance in knowing when it is most suitable to get it resolved.
MR. TAUMAN: Well, the sooner the better because of the timing. As I said, we have had some discussions and some counter-discussions over the last three or four days. I am ready to put whatever arguments we have before you now.

We can wait until the lunch hour, afternoon break, after court, at your convenience.

THE COURT: Mr. Harting?

MR. HARTING: There has been some limited discussions. I would prefer to do it a little bit later in the afternoon since I just received it, if that's okay.

THE COURT: Sure.

MR. HARTING: And we may -- this is -- and I have served this, two versions of an order on one of the motions in limine, and one of Mr. Beatty's issues, and he will be available any time the Court wants this afternoon, too, but he wanted me to give you an opportunity to read it first.

THE COURT: Let me ask Mr. Cofer, since the prime activity underway right now is cross-examination, what your time expectations are with Dr. Ferone.

MR. COFER: And I am not trying to be coy, I really don't know. I covered some stuff. I usually don't spend a lot of time. He's covered a lot of ground. We're going to go at least, I would bet, into the midafternoon, maybe later. That's the best I can tell you.

MR. GAYLORD: I think we would plan to have that be the rest of the end of the week, I guess, then.
THE COURT: Without reading any more?
MR. GAYLORD: We could conceivably read some more, but I think maybe this is time to exercise that. Mr. Cofer had asked yesterday whether we were going to let him catch his plane at 4:40, and so we kind of indicated we didn't have any opposition to that. And so I guess it's in his hands, but I would say --
THE COURT: He doesn't need to be here for reading, though, does he? I mean, he needs to catch his plane, because we've covered all of that ahead of time.
MR. TAUMAN: Your Honor, if I may comment, I think -- don't we have some redirect?
MR. GAYLORD: Oh, yeah, we're going to have some redirect.
THE COURT: I am not suggesting you won't have redirect. I am trying to figure out what time is most predictable to address the motion to compel and this issue about the motion in limine.
Mr. Cofer doesn't need to be here for the

motion to compel. Looks like Mr. Harting is on deck for that. Mr. Beatty will be on deck for the motion in limine.

Why don't we say 4:15, no earlier than that, and then you'll just have to do what I do, which is wait on all of them to see where we actually end up. If we finish about then, I'd be happy to take it up. I don't know what good I am to you much past 5:00 today, because I am wearing myself.

So I don't want to make important rulings at 5 o'clock on Friday. It is just a bad practice. If you need it, I'll do it. But, you know, we'll see where we are, and I appreciate the heads up.

I'll just give you a reaction to the issue about which you can maybe plan. I have not actually had this particular issue come up, but it seems to me that if the Court's conclusion is that I can't compel, if I conclude that I can't compel, that may, in fact, cause a delay in the trial in order for the plaintiff to catch up by way of fairness and an opportunity to prepare, so I have to weigh the logistics as well.

Now, if there is authority to compel production, then I can consider it. If there isn't authority, if I don't have the authority to order the report because -- and I'm assuming that the defense position is going to be that this is essentially work product, and it isn't the report of a medical examination under Rule 44 -- then we have to deal with it like we do every other expert witness discovery problem.

It's a fairness call. And if plaintiffs can't be fairly ready, that might mean a witness can't be cross-examined right away. Those are the competing factors, and the timing of the trial, and everybody -- Mr. Dumas, you are frowning at me again.

MR. DUMAS: I am not frowning, Your Honor.

THE COURT: Okay. You're not frowning. I accept that. Scowling.

The discovery of expert witness material is something that I think everyone is always concerned about in our court proceedings, and of late, there has been lots of interest in it from the Bar generally. I will simply say that to the extent the Court doesn't have authority to

compel production before a witness testifies, the Court does have authority where, in fairness, more time is needed to respond to extend the cross-examination.

I am just making an observation that I hope is practical and may be helpful to you in continuing to discuss a resolution of the problem. It is just a thought.

MR. TAUMAN: Thank you, Your Honor.

MR. GAYLORD: My comment about our expectation for the rest of today was just, I guess, harking back to our thoughts before trial about whether we might have -- leave a Friday afternoon flexibility.

And we decided that since, otherwise we'd have to have somebody on standby, we would assume this is going to take a day.

THE COURT: Well, I want to say that I tried to propose to all of you a schedule where we could predict certain timeouts, and nobody wanted to accept my offer. And I don't mind that you all are in charge of your case and the order of proof, except to the extent it results in a delay in the ultimate getting the case to the jury.

So you know, to the extent I'm a potted plant on the schedule thing, it is always nice to know that you're planning not to have trial late in the day. That's good for me to know sooner rather than later, and now I know.

We'll just press through. And we'll deal with these other issues this afternoon on the record at 4:15, unless we go so late as to make it unworkable tonight.

MR. GAYLORD: And I do have probably a 10-minute offer of proof with Dr. Ferone.

THE COURT: Okay. Well, maybe we can do that at the noon break when the witness -- when the jury goes. We need to obviously do it.

MR. GAYLORD: Sure.

THE COURT: Okay. Now are we ready for the jury?

MR. TAUMAN: Thank you, Your Honor.

THE COURT: Bring them in, please.

(Whereupon, the following proceedings were held in open court, the jury being present:)

THE COURT: All right, jurors, we're back.

Mr. Cofer.
MR. COFER: Thank you, Your Honor.
BY MR. COFER:
Q. You may be seated for the moment.
A. (The witness complies.)
Q. Dr. Ferone, you were proud of the work that you did at Phil Morris working on a safer cigarette, weren't you, sir?
A. That's correct.
Q. You were proud of the work that your scientists, the scientists in the applied research directory, did on safer cigarettes, correct?
A. That is correct.
Q. You thought that work was in the best interest of Philip Morris' customers, right?
A. Correct.
Q. You thought that work served the public health interest?
A. That is correct.
Q. You thought that work served the interest of the medical and scientific communities, correct?
A. Correct.
Q. Philip Morris was working on safer cigarettes before they hired you, right?

A. Yes. The conversations we've had with reducing tar --
Q. Right.
A. -- and nicotine, yes.
Q. And they were working and they continued to work on safer cigarettes after you left?
A. Correct.
Q. Why don't you step back down, if you would, and let's do another chart, please.
A. (The witness complies.)
I am going to use this as a cheat sheet, so just tell me if any of this doesn't ring accurate.
You don't believe that cigarette smoke contains any magic bullet or such that causes cancer. It is not a single thing, it is a classic compound; is that right?
A. Correct.
Q. And you have identified those compounds in the past, haven't you?
A. Classes.
Q. Classes. Could you do what for the jury, and maybe just title it. What do you want to call it, the big four compounds?
A. Yeah. What we're doing is breaking the

potential problem chemicals into groups, so that we might attack those groups.
Q. Okay.
A. And the first group is the nitrosamines, which includes the tobacco specific nitrosamines. The second group I'm going to call aldehydes.
Q. Okay.
A. The third group, I'll just refer to as -- well, I'll spell it out --
Q. Do you want me to show her to make it easier, polycyclic aromatic hydrocarbons.
A. Let's call those PAHAs, either polycyclic aromatic hydrocarbons or polynuclear aromatic hydrocarbons; but, basically, that's the third group.
And the fourth group, let's call heavy metals, which includes things like polonium 210, could be things like mercury, things of that sort. And these are the major components. There are also the gas phase constituents, like carbon monoixide, and outsides of nitrogen.
Q. Okay. So what do we want to call this so the jury will know what this is, carcinogens?
A. Well, target compounds to remove. They each have bad physiological effects. These aren't

actually carcinogens down here. Some of these may not be. These are the primary carcinogens.
Q. Do you want to number them? Did you list them in order of importance?
A. I listed them in the order of importance.
Q. Why don't you go ahead and number them one, two, three, four, so we'll know.
A. (The witness complies.)
Q. Now, target compounds removed. As I understood your testimony yesterday, you talked really about two different approaches that Philip Morris took, and I guess the scientific community in general took, and that is general reduction and specific reduction. Is that a fair way to divide it?
A. That's right.
Q. General reduction is what we talked about where you just try to bring the overall tar levels down, right?
A. Correct.
Q. You just bring everything, tar down, the less tar the better, correct?
A. Yes, but, remember, the tar doesn't include the gas phase, so bringing tar down does the nitrosamines, the aldehydes, the PAHs, to the

extent that they occur in the tar and heavy metals. These require something a little bit different.
Q. Okay. But in terms of general reduction, what we're talking about is just bringing those classes down in general, right?
A. Correct.
Q. Then you talked yesterday about something called specific reduction, right?
A. Correct.
Q. And maybe we ought to write general reduction and specific reduction on the bottom of this chart?
A. (The witness complies.)
Q. Thank you. Dr. Ferone, as I understand specific reduction, what you do, you try to find ways to target specifics classes of compounds and remove those. You find a way to take the nitrosamines out, right?
A. That's correct.
Q. And that may or may not take the aldehydes or the polycyclic aromatic hydrocarbons out, but you focus on a specific class, right?
A. Right.
Q. And you did work at Philip Morris to try

to accomplish that, didn't you?
A. Yes.
Q. Now, you do have to be careful, though, that you don't run into a situation where in removing one, you increase the other, correct?
A. I don't know if careful is the right word. You frequently find that when you remove one, you might increase another, so that requires you to do one of two things: Make a determination as to which one is worse, which is this list?
Q. Right.
A. Or make a determination, you continue to try to remove both of those.
Q. But I guess my point is and I think you agree with me, if you take the nitrosamines out, you have to be careful in doing that, you don't pump something else back up, right?
A. Well, yes.
Q. I mean, nitrosamines is number one and maybe that's a bad example. You really want to do something to remove the PAHs, yet dramatically increase the aldehydes, right?
A. Or the nitrosamines.
Q. Or the nitrosamines?
A. Yes.

Q. You talked about the burning cold. Do you remember that yesterday? And there has been work done to reduce the temperature of burning coal, right?
A. Correct.
Q. And the thinking was if you reduce the temperature, what would you reduce the PAHs?
A. Correct. If you reduce the temperature, these occur at high temperature, and these occur at low temperature. So originally one hypothesis was that fewer people who smoke pipes are observed to get cancer than people who smoke cigarettes.
Well, one of the hypotheses was that, well, pipes burn at a lower temperature, so we'll reduce the temperature of the burn in the cigarette, and that would cause to remove the polycyclic aromatic hydrocarbons. But when we did that, we increased the amount of aldehydes, especially with certain compositions of the product, and these actually have more activity than polynuclear aromatics.
Q. And that's an example of a trade off. You have to be careful about those, right?
A. Correct.
Q. Now, what you marked -- what I have

marked as Defendant's Exhibit 911, where you talked about your ultimate design, right?
A. Correct.
Q. Feasible alternate design. Do you know, if you did that, would you take all the nitrosamines out?
A. Yes.
Q. Because no tobacco?
A. No, because no nitrosamines.
Q. Would you take all the aldehydes out?
A. Yes.
Q. Would you take all the PAHs out?
A. Right.
Q. All the heavy metals out?
A. Right.
Q. All the gas phase stuff?
A. Right.
Q. Now, let me ask you this: What can you do to a cigarette, and I'm going to define a cigarette as something containing tobacco, do you have a feasible alternative design for a cigarette that contains tobacco? And without going over the same ground, is it fair to say you don't know of a way to make a cigarette that contains tobacco completely safe?

A. Well, I think you can come pretty close, not as safe as the other one.
Q. Let's hear it.
A. It depends on our definition of tobacco, but if you think about the alternate in genetic modification of the plant, if we did what we talked about, is to make a tobacco variety that had no nicotine, no nitrate, and all it had basically was cellulose.
Q. Let's write these down, if you would, please.
A. I am not sure -- okay.
Q. Let me tell you, so there is no confusion, let me tell you where I am going with this.
A. Okay.
Q. My first question, can Philip Morris make a safe cigarette, and we talked about the sort of design where you think they could, and we quibbled a little whether that was a cigarette because it didn't have tobacco, whether people would smoke it, whether the flavors would be acceptable, and we talked of those sorts of things. I think I have an understanding and the jury does of that product.

Now I want to talk about something that is as closer to a cigarette as we know it.
A. Okay. These are safer.
Q. Okay. I'll tell you, it would be great if you can tell me, can you make it safe, safe the way I designed it before. You could tell the public, "If you smoke this, this won't give you cancer, this won't give you heart disease."
A. I can't obviously do that, but what I can do is give a description of something that will come close, that may.
Q. And let's just make sure we're on the same page on this, because I think we're agreeing, you can't come up with a cigarette that contains tobacco that you could assure the public was safe, right?
A. Totally safe, that's correct.
Q. You believe you can come up with one that would be safer, right?
A. Much safer.
Q. Okay. Tell us how you'd do it.
A. It's based on this, the definition of tobacco. And what we have to do is create new tobacco varieties, cultivars, through genetic modification, that are very high in cellulose.

They are very low in nitrogen as a specific element by any way you want to incorporate it.
So for example, they would have low protein. In the conventional tobacco leaf, there is about seven percent protein. One of our projects actually involved trying to remove that protein.
Q. May I stop you right there. When you say conventional tobacco leaf, what you're talking about is the natural tobacco plant, right?
A. No. I am talking about the varieties that are in use today. None of those really are the natural tobacco plant. The natural plant, nicotina tobbacum (ph), is a long way removed from the varieties that agriculturally are grown today. If you looked at that, you would think it was a weed.
Q. Okay.
A. As a matter of fact, you can buy them from landscaping people, flowers and stuff, so they have modified that by selection over the years. That's the state programs you were talking about before.
Q. Is that an example of genetic modification or genetic engineering?

A. No. That's an example of genetic selection.
All right. So what we're talking about is going to the next step and making a tobacco that is high in cellulose and low in nitrogen and that will not pick up nitrates.
Q. May I stop you there. Nitrates, one source of nitrates is the soil and fertilizer?
A. Yes.
Q. All right. So would you engineer the tobacco so that it wouldn't pick them up or would you just change the techniques that farmers use?
A. You can do both. It will not pick up nitrates, and it will not pick up heavy metals. This would give you a tobacco leaf that when you burned it, as far as I recall any of the data that I've seen, would be close to burning pure cellulose.
And that's similar to materials that have been proposed, things like cytrel and low tar filler. There have been materials proposed for use by the industry that were pure cellulose.
Q. Proposed by whom when?
A. Let's see if I remember all this now. Cytrel, I believe, was a salience material

proposed by -- then salience, now called hoist (ph) salience, and that is basically a form of cellulose, when burned in testing gave very mutagenicity, carcinogenicity scores.
Q. Okay.
A. There are also projects sponsored by the USDA, for example, where you would remove the protein from tobacco that would end up giving you cellulosic mass that you can burn. And I believe there were various -- I know, I just can't remember exactly whose they were -- gums, there also natural products that are very high in cellulose.
Q. All right. So what else? You start with this high cellulose, low nitrogen tobacco, won't pick up nitrates, heavy metals. Is that it?
A. No tobacco specific nitrosamines in this tobacco.
Q. So you're saying that there won't be any?
A. We're going to make the tobacco such that it doesn't produce that.
Q. And how are we going to do that?
A. We're not going to put alkaloids in it.
Q. Alkaloids are?
A. Nicotine, nornicotine. There is no

nicotine in it.
Q. So we're going to genetically engineer a plant, a tobacco plant?
A. Right.
Q. And we're going to genetically engineer it in a way that it won't have nicotine or nornicotine or any sort of alkaloid, right?
A. Right.
Q. Go ahead.
A. This is going to form the basis of the tobacco that we use, but in order to provide the nicotine, we're going to have to extract nicotine from other tobacco --
Q. All right.
A. -- and apply it.
Q. Does it matter the source of the nicotine?
A. Well, this is pure. We're going to purify and extract nicotine. I mean, pure nicotine, so it is going to come from a conventional cultivar.
Q. Bright or Burley?
A. Right.
Q. Does it matter whether it is Bright or Burley?

A. As long as you purify it, it doesn't matter. Preferentially, depending on your purification techniques, it might be easier to get a pure nicotine from Bright than from Burley, because of the nitrate and other things in the Burley, but technology is available to do either. It's called chromatography.
Q. Okay.
A. Extract nicotine and apply. This is nice because you can control the composition of this. You can control the exact amount of nicotine that you have and so you have control over the delivery of this product.
Q. And let me stop you on that point. There is nothing wrong on controlling the product, is there?
A. No.
Q. In fact, that's really the desire, right?
A. Yes.
Q. Because you want to be able to predict what the product is going to do, correct?
A. That's right.
Q. And you want to be able to assure consumers that every product they buy is uniform and the same and consistent, correct?

A. That's one of the motivations, yes.
Q. Is that it?
A. That's it.
Q. Would that taste good?
A. It's -- similar products have been judged acceptable. Whether it is as good as a Marlboro, you may have to -- you may have to add some accepted, tested flavorants in it, but it provides the nicotine and avoids the other problem. Let me put it this way, if it were a choice between using this product and not having a product available, people would use this product.
Q. Back to my question. Would it taste good?
A. I don't know.
Q. So should we at least put for consideration adding flavorants?
A. You can.
Q. Okay.
A. But again, all of this is subject to testing it to make sure that you haven't, by doing this, created some of the things that I just went to great --
Q. Aldehydes?
A. Nitrosamines.

Q. Would you need to add anything else or is that it?
A. That's it.
Q. Would you put a filter on it?
A. Well, you could or you could not. You have an option to do that.
Q. Do you even need a filter with this thing?
A. You may not, depending on the structure of the cellulose and whether the density is such that you achieve very low tar numbers. I don't know how -- you know, it would be based on the biological testing which you would do.
I would suspect if you're going to put a filter, it is going to be diluted, because, again, you are going to put a certain weight of material here, and we're going to try and control the delivery of everything we have, and that's easier in do with a filtered product.
Q. How much nicotine would you put in it?
A. That would have to be determined by testing.
Q. Would you offer consumers a range of nicotine?
A. I don't think so. I think you would just

find the nicotine level that, when delivered, gives the satisfaction that is found a in, say, smoking a Marlboro.
Q. Is that the same for all people?
A. The nicotine level in which --
Q. Satisfaction?
A. No. But right now, Marlboro is the -- that range, Marlboro regular, that's what we call the high delivery range, so that's the top end of the line in terms of providing nicotine, so everybody below that could just smoke fewer of them.
Q. So if they smoked fewer of them, would they get the same satisfaction, impact, pleasure that you talked about?
A. Well, there is an issue with doing this that has been discussed many times, but it's not really discussed by the industry, and that is educating people on how to smoke a cigarette, how to use the product, so if you educated people on how to use the product, you could get them to suck less deeply. If you want to get less, you would have to tell them how to go that.
Q. There has been discussion of that. Let me make sure you're on the same page. That's

based on the premise that people smoke for nicotine, right?
A. That's based on the conclusion that people smoke for nicotine.
Q. Right. Okay. Based on the conclusion that people smoke for nicotine. Are there other reasons people smoke?
A. You mean after I have a sufficient amount of nicotine -- well, first of all, I think we stated and I think it is Philip Morris' experience that a cigarette without nicotine in it doesn't sell.
Q. Okay. And we'll come back to that, too, but my point is essentially is what you are saying, you make this cigarette, you put in whatever amount of nicotine that the people in the lab figure and all the tests and the EEG brain waves and stuff, is what you need to maintain the experience or whatever, and then that's it. That's the product on the market and people either buy that one or they don't.
A. No. We talked about educating them as to how to use that product to either get more or less nicotine: Smoke fewer per day, don't draw as hard.

If you wanted to -- and it turned out that the education, trying to educate people on how to use the product didn't work, then maybe you might find ways to make separate product, separate class of product, but to my knowledge the concept of educating people on the use of the product is relatively new in the industry and it could have been used at any time, to educate people how to properly use the product to get whatever level of nicotine you want.

Q. Let's say we call this product Cellulose. You could have like a Cellulose Light?

A. If you want to call the amount of nicotine that you're referring to.

Q. Right.

A. I suppose.

Q. Would you put different flavors in for different taste?

A. You could, provided they were all tested and shown to be safe.

Q. Okay. Is this product right now technologically feasible?

A. The tobacco to do this is not available. The high cellulose, low nitrogen.

Q. The nicotine is available; is that right?

A. The nicotine is available, the flavorants are available, and the technology to do this is available.
Q. But the tobacco is not available?
A. It hasn't been done. That's one of the projects that wasn't done.
Q. But you know it can be done?
A. Yes.
Q. When could it have been done?
A. Probably any time after 1969 or '70.
Q. Let's write that down, too. And I would like to go ahead and mark this. In fact, let me mark all the ones, the last was 911.
MR. COFER: I'll need 912, '13, '14 and '15, please. I'll mark all of these so we can refer to them more easily.
For the record, I am marking at Defendant's Exhibit 912, the chart that is labeled at the top, "Projects killed."
I'm marking Defendant's Exhibit 913, "Whole product testing."
Defendant's Exhibit 914, "Target compounds to remove."
And finally, 915 is the chart that says, "Contains tobacco." And how shall we describe

that? Is this the safer cigarette with tobacco; is that fair?
A. Yeah, the almost safe product.
Q. How do you want to do it? Write it up there, so we'll know what we're talking about.
A. Call it, "Almost safe."
Q. All right. Almost safe, what does that mean? You smoke it. Can you get cancer from smoking it?
A. Well, we wouldn't know. We'd have to do some extensive testing. Probably this could be arranged so when you did testing, by this, I mean epidemiological results after 15 or 20 years, you would not show much difference between users and non-users.
Q. Let's talk about testing. There has been a lot of testimony about the sort of testing that can be done, won't be done, isn't done. You talked yesterday about something called in vitro testing.
A. Right.
Q. And I think you may have misspoke or else I misheard or I misunderstand, but I think you said that was not human tissue testing -- not human, that was not living cell testing or living

organisms?
A. It is not whole animals.
Q. You are testing living things?
A. Oh,yes, everything you're using, all the cells are alive.
Q. Basically, you are talking about test tubes and Petri dishes and that sort of stuff, right?
A. Right.
Q. You have in vitro testing, and then you have in vivo testing, right?
A. Correct.
Q. Those are whole animal tests, things like mouse skin painting, correct, inhalation tests?
A. That's correct.
Q. So that's testing that can be performed on the product or components of the product, right?
A. Right.
Q. And with in vitro testing, I think you told the jury that was done at Richmond, right?
A. That is correct.
Q. In vitro testing, what you do is you take something you're looking at, say an additive or whatever, and you do certain tests to see whether

it is biologically active, right?
A. Well, you burn it first, right. We're talking about smoke here, and you collect the smoke and apply the smoke to the tests.
Q. And what you're looking for is to see whether -- stay with me on this -- it's biologically active, right?
A. Yes.
Q. Whether it is mutagenic?
A. Correct.
Q. And whether it is carcinogenic?
A. Correct.
Q. Teratogenic?
A. Correct.
Q. And toxic is the fourth one you had?
A. Right.
Q. And you can do that and you can get clues about, gee, this product is more mutagenic than that product, right?
A. Correct.
Q. Or this product kills more cells and is more carcinogenic than this product?
A. Right.
Q. The next order of animal testing is where you actually take a live animal and you do

something to the animal and study the effects?
A. Apply either the smoke directly, like you would in an inhalation test, or you apply condensed smoke as you would in skin painting. It's a wide variety.
Q. What Wynder and Graham did is they took a strain of mouse and they essentially put them in two categories, and they shaved their backs, and on one of them they put tobacco smoke condensate, right?
A. Right.
Q. The other they put some sort of sham, right, water or control or something, but not the condensate, and maybe on some of them they didn't do anything, right?
A. Right.
Q. And they looked to see whether one group got more skin tumors than the other?
A. And that's simply one kind of test.
Q. And then you can actually do inhalation tests where you can put mice or any sort of animal really in an apparatus where they breath whole smoke, right?
A. Right.
Q. And you look to see whether they develop

tumors?
A. Correct.
Q. So those are the sorts of animal testing that the company can do, correct?
A. Yes.
Q. And then what you were talking about, in terms of determining would happen if you did this, you talked about epidemiology, right?
A. Correct.
Q. And what you would have to do then is you would have to wait until a sufficient amount of time went by, 10, 15, 20 years?
A. Right.
Q. And you'd look at people who smoked this product?
A. Correct.
Q. You compare them to people who didn't smoke at all?
A. Correct.
Q. You would look at their rates of lung cancer, for example?
A. Correct.
Q. And what you would be looking for would be to see whether the people who smoked this product had higher rates of lung cancer than the

people who didn't?
A. Correct.
Q. And if they did, all the other things being equal about them, you could say there is a statistical association between smoking this product and lung cancer?
A. No.
Q. Well, there would be a statistical association?
A. But you can say, all other things being equal, you can say that it causes the lung cancer.
Q. That was a very important distinction, thanks, I was wrong. Let's back up on that. Forget all those other things being equal for the time being.
If you saw the people who smoke this product had more cancer than those who didn't, the first thing you would say, "There is a statistical association between smoking that product and getting cancer."
A. Right.
Q. Because the more people that get lung cancer smoke the product, right?
A. Right.
Q. So what you would have to do is you'd

have to look at other things about the people who smoked?
A. Correct.
Q. If there were other risk factors for lung cancer, you would want to take those into account, right?
A. You have to remove those from the analysis in order to make the conclusion that the product --
Q. But that is something that would take some time. Would that be a prospective epidemiological study?
A. You could do it like the Farmingham study for --
Q. Hear disease.
A. Heart disease, yes. You could do it that way, and that's probably the best way to do it.
One of the problems with all of this is that the industry has been extremely reluctant to allow product by product categorization. People get lung cancer, but we don't keep track of whether it is from a Marlboro, a Merit or a Winston. And in order to distinguish whether you are making progress, you need to be able to do that.

Q. Epidemiologically, the way you would do that, I guess, is you divide -- you'd have to get a big enough sample population that you had some confidence in the results, right?
A. Right.
Q. And by that what I mean is if you just took three people who smoked Marlboro and then got cancer, and you had three people who smoked Merit and they didn't, the sample size would be so small, the statisticians would say, "There is no confidence that result isn't spurious," right?
A. For the same reason, you couldn't take a 100-year-old man who's been smoking and say just because he has done it, it doesn't cause cancer.
Q. Right. You have to get a big old sample size. You'd have to get a bunch of people who just smoked Marlboro?
A. Right.
Q. Not other brands, just Marlboro, right?
A. Marlboro versus the control.
Q. Or compare it to another brand. You take a group that just smoked Marlboro, because if they had smoked other brands, that would confound it, wouldn't it?
A. Yes.

Q. If they smoked Marlboro and Winstons and Viceroys, that data wouldn't tell you what smoking Marlboro did, right?
A. If you had a large population now, you can't divide it up into people that only smoke specific brands.
Q. See, what I was going to is you told the jury in response to one of my questions, the tobacco companies were reluctant to allow these epidemiological tests to be performed on a brand-specific basis? Do you remember, didn't you say that?
A. Yes.
Q. So I was trying to explore with you what you would have to do to have that study?
A. You would just have to meld that with the data, the Maxwell data that is used for keeping track of people who smoke and brand switch and all of that stuff that I have seen.
Q. What you would really want to do is take a group, a large enough sample size who just smoked Marlboro and compare them with a group who just smoked Merit, and see if there is a difference, right?
A. That's why a perspective study that we

talked about where people agree that they're going to do that is the way to go.
Q. Exactly. The problem now is you could have Maxwell data that talks about brand switching, right, "I smoked Marlboro for five years, and then I smoked Benson & Hedges Light, and then I smoked Kool, and first of all, that information really isn't that precise because people have imprecise memories, right?
A. Yes.
Q. You don't know how many Marlboros they smoked versus how many Viceroys they smoked, right?
A. That's correct.
Q. You talk about compensation if they smoked twice as many Viceroys as Marlboros, that would mess things up?
A. Well, it's doesn't mess it up. That's just data that needs to be sorted out.
Q. It certainly makes it more confusing in making the sort of comparisons that you told the jury the industry has been reluctant to make?
A. Correct.
Q. All right. Let me ask you this, and this is just a big picture question. It's true, isn't

it, that Philip Morris has a financial interest in making a safe cigarette?
A. That is a very difficult question. I don't think that's necessarily true.
Q. Well, let's explore that. 50 million people in this country smoke, right?
A. Correct.
Q. They smoke cigarettes with a warning on the back that says they cause cancer, right?
A. Correct.
Q. If Philip Morris could come up with a cigarette that people liked, that people smoked, that didn't cause cancer or didn't cause most cancers, it would be a license to print money, wouldn't it?
A. No.
Q. Really?
A. The problem is that Philip Morris Marlboro cigarette is the largest selling brand. If you open the door to a safer cigarette, you open the door that your competitors might also sell a different brand. It is not going to be the same as Marlboro; it is not going to taste the same as Marlboro, so Marlboro share might go down like a rock if RJR came out with a safer

cigarette.
As soon as you have opened the door to safer cigarettes, you've opened the door to Marlboro losing its preeminence as a brand, so that might absolutely kill Philip Morris.
Q. Let's test that, let's test that. You've got 50 million people who are smoking cigarettes right now that may well cause cancer, right?
A. Yes.
Q. In fact, most people believe they do. Wouldn't you agree that most people believe cigarettes do cause cancer?
A. Except for people that work in the industry.
Q. Sure, they hear me say there is a statistical association, they say, "Hogwash." They say it causes cancer, right? They hear me talk about scientific proof versus epidemiology and they go, "It causes cancer," right?
A. I hope so.
Q. I mean, that's what people believe, don't they?
A. I hope they understand.
Q. Yet 50 million Americans smoke, right?
A. Is that 17 percent?

Q. It's 25 percent, but if you are not comfortable with 50, let's say 40?
A. Okay.
Q. A bunch of people smoke.
A. Lots.
Q. Now, think of it, if Philip Morris or any company, not just Philip Morris, but Philip Morris is here today, so let's talk about them, could come up with a cigarette that made the nicotine in a cigarette like caffeine in coffee, you get your nicotine hit, you get your caffeine jolt, no health problems, you are on your way, that is an absolute license to print money, isn't it?
A. I still disagree. I'll give you another reason.
Q. Give it to me?
A. Because that's an admission that the product you have been selling before is not safe. It opens all kinds of prospects of litigation that could cost you money.
Q. You know, I've heard that and here is what I was wondering about that. Do you think a jury would be mad if Philip Morris came out and said, "You know what, we were finally able to do it. We can show you how we worked on it. We've

got the product, we have finally done it." Do you think the jury is going to be mad at them because they did something no one else could do?
A. No, I don't think the jury is going to be mad at them for that. The problem is that people who used the product before --
Q. Right.
A. -- and didn't have access to any information that showed that that product, in fact, was worse than the product they were now selling, and worse than some competitive product -- I have heard it said, for example, that smokers could reduce their risk by switching to a low-tar brand, switch to Carlton or Merit Ultra Lights, and yet as I testified yesterday, and I still worry about, I have yet to see in any Philip Morris file or anyplace else, data comparing those, even on the simple biological activity, the in vitro study or an in vivo study, so how do people who have access to those products know that that is really safer or better?
Q. Let's go back to the big picture because we're talking about ways to do it. You're telling me that it would not be -- or you're telling the jury, not telling me -- that it would not be in

Philip Morris' financial interest to market a safe product if they could?
A. No, I didn't say that it wouldn't be in their interest to do. As a matter of fact, the objective was to do it. You were talking about the implications of marketing. It is not a license to print money.
There are risks involved in marketing, and I was going through what those risks are; so, in fact, it isn't necessarily a slam dunk that if you had the product, that you would rush right in the market with it.
Q. Because a fear of lawsuits?
A. No. The fear of losing preeminent position in the marketplace.
Q. You said lawsuits. Do you want to take that back?
A. No, that's secondary.
Q. So rather than coming into court and saying, "We've got a safe product we've worked on," we come in and say, "Gee, we don't have one and we can't make one and Dr. Ferone comes in and says we can." Which position do you think Philip Morris would rather be in?
A. I think Philip Morris would rather be in

the position in a lawsuit of having a safe product.
Q. Let me read you a quote. "Boy, wouldn't it be wonderful if our company was first to produce a cancer-free cigarette, what we could do to the competition."
A. When was that?
Q. Mid-1950s, from the PR firm, Hill & Knowlton, quoting an unnamed tobacco company research director. "Boy, wouldn't it be wonderful if our company was first to produce a cancer-free cigarette, what we could do to the competition."
Now, you were quoted January 31st, 1999, it's a paraphrase.
MR. GAYLORD: Excuse me, counsel. Could you tell me the date of the quote again.
MR. COFER: Well, it's in the article and it just says -- I will give you a copy of the article. It says mid-1950s.
MR. GAYLORD: Thank you.
BY MR. COFER:
Q. Now, let's go to January 31st, 1999, that's when it was published, you were obviously interviewed before then.
"And he," which means you, "notes, 'Any

company that produced a less-hazardous cigarette could finally make that health claim in advertisements and see the huge marketing advantage predicted more than 35 years ago.'"
A. And I qualified that by the advertising, which we haven't talked about yet.
Q. Well, you bet. If you could make a safe cigarette, if the technology existed, you would shout it from the rooftops, "Sue me, I don't care."
A. They would have to prove it.
Q. Right. Well, we're talking about if you could do it.
A. Right.
Q. "Sue me all day, I have a cancer-free cigarette," essentially, right?
A. Correct.
Q. Now, I'll tell you something else, I was puzzling last night over your testimony. I sat with rapt attention like everyone else did, and one of the first things you told us was you were recruited by Philip Morris, right?
A. That's correct.
Q. You didn't seek them out, they came and found you?

A. Correct.
Q. We talked about the promises they made to you earlier this morning, right?
A. Right.
Q. And they said, "Dr. Ferone, we want you to do two things for us. We want you to help us diversify, and you had experience with that, we want to do that," right?
A. Correct.
Q. They said, "We want you to help us develop a safer cigarette," right?
A. Correct.
Q. "Because we're going out of business in 10 to 15 to 20 years because of the health scare."
A. Correct.
Q. So Philip Morris hired you in 1976, to help them develop a safe cigarette because if they didn't, they were going out of business in 10 to 15 to 20 years, right?
A. That was the general feeling at the time, yes.
Q. But they didn't want to make a safe cigarette?
A. The way it ended up working -- no, they wanted to make a safe cigarette. The way it ended

up working, however, is that the way the people had interpreted that -- remember, that's the time when low-tar cigarette, that entire low tar and ultimate tar are coming into being.

And the sale of the low-tar cigarette was a way of extending that time. If they had continued to sell the same unfiltered cigarette in the '50s, or the high tar Marlboro only without going to lower tar brands, they would have been in a lot of trouble a lot sooner, okay.

People would have died of cancer at ever-increasing rates, and they would say, "They're not doing anything about it." What we have here is a situation where the industry says, "Okay. Here is low-tar cigarettes. We're doing what the Tobacco Working Group says we should do. We're trying to make the cigarette safer."

Now, they don't prove it. They just say, "Here is low-tar cigarettes." They don't make any claims about that, so people think that a low-tar cigarette is a safer than a high-tar cigarette.

Q. Okay. We're going to come back and talk about what they did and talk about low tar and nicotine. As I listened to your testimony yesterday, basically what I heard was here were

the things that Philip Morris didn't do, here were the things Philip Morris should have done. This whole safe cigarette thing was just a big old small. This is all about nicotine and addiction.

Doctor, you said Philip Morris cares about two things: Money and market share. And so I thought about that, and I said, "Wait a minute, the way you make the money is to make a safe cigarette. And Dr. Ferone told me yesterday when they hired him, they said, 'If we don't come up with a safe cigarette or diversify, we're out of business.'"

A. Ultimately.

MR. COFER: You want to go later or is this good time to break?

THE COURT: Is there a good place for you?

MR. COFER: Good place for me.

MR. DUMAS: It's a good place for us, right, jurors?

Okay. I need to do something with the lawyers about 1:15, so let's have you back at 1:30. All right. Notes on the chairs, please, don't discuss the case, watch your step, and it's not raining.

(Whereupon, the following proceedings were held in open court, out of the presence of the jury at 11:55 a.m.)

THE COURT: Mr. Gaylord, your option, if you want to do the offer of proof now or at 1:15.

MR. GAYLORD: I think 1:15 would work better for me.

THE COURT: Anything else for the record?

MR. GAYLORD: No, Your Honor.

MR. COFER: Nothing, Your Honor.

THE COURT: 1:15 then.

(Court adjourned, 3-5-99, Morning Session, at 11:58 a.m.)

REPORTER'S CERTIFICATE

I, Katie Bradford, Official Reporter of the Circuit Court of the State of Oregon, Fourth Judicial District, certify that I reported in stenotype the oral proceedings had upon the hearing of the above-entitled cause before the HONORABLE ANNA J. BROWN, Circuit Judge, on March 5, 1999;

That I have subsequently caused my stenotype notes, so taken, to be reduced to computer-aided transcription under my direction; and that the foregoing transcript, Pages 1 through 123, both inclusive, constitutes a full, true and accurate record of said proceedings, so reported by me in stenotype as aforesaid.

Witness my hand and CSR Seal at Portland, Oregon, this 5th day of March, 1999.

_____

Katie Bradford, CSR 90-0148
Official Court Reporter

I certify this original/duplicate original is valid only if it bears my red colored CSR Seal. Katie Bradford